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Energy Lesson – adapted from [www.scienceandkidsactivities.com](http://www.scienceandkidsactivities.com)

Water, Energy and Waste: Integrating Themes of Sustainability into your Classroom

July 9, 2012

**Grade level: 3**

**NYC Scope and Sequence:**

* Observe, identify, and describe a variety of forms of energy: sound, heat, electric, mechanical, chemical (PS4.1a)
* Identify the evidence for energy transformations and how humans uses these every transformations. Heat to light, chemical to electrical, electrical to sound (PS 4.2a,b)
* Interactions of matter and energy (e.g., electricity lighting a bulb, dark colors absorbing light) (PS4.1d)

**Teacher competency 3C:** Engaging students in Learning

Activity: To discover what happens when a flashing ball bounces

Read Aloud: Move it! motion, forces and you by. A. Mason

Background: Students have been studying energy as part of their science unit. They will be using their prior knowledge about energy in order to actively participate and make observations in today’s lesson.

Students have previously learned:

* Energy is the ability to work and change matter. Energy can be potential and kinetic.
* Stored energy is potential energy. Examples of this energy include chemical, mechanical and gravitational.
* Chemical energy is stored in the bonds of atoms and molecules (batteries coal, natural gas).
* Mechanical energy is stored in objects by tension (compressed springs and rubber bands).
* During a bounce from a hard surface, the ball’s surface dents. Denting a surface takes energy and virtually all of the ball’s energy of motion (kinetic energy) goes into denting its own surface. For a moment the ball is motionless and then it begins to rebound. Bouncing is related to elasticity. Any object that stores energy when deformed will rebound when it collides with a hard surface.

**Materials:**

* Energy Concept Map handout
* Flashing bouncy balls
* Science journals

**Procedure:**

“Today we are going to continue our discovery of energy. What are some examples of energy?” Create a running list of student’s responses. Then ask students to look at the examples and turn and talk with a classmate to discuss the question, “What is energy?” When partners have agreed on a definition, have them write this definition of energy in their science journals.

1. Hand out the Energy Concept Map (below) to students and have them compare their examples and definitions of energy with the concept map on the handout.

2. Instruct students to think about energy in their everyday lives. Have them brainstorm examples for each of the

following forms of energy: heat, light, sound, electrical, and mechanical and fill in the chart on the Energy Concept Map handout.

3.Have students work in pairs and give each pair a flashing, bouncing ball. Challenge students to explore what happens when the ball bounces. Instruct students to record their observations in the data collection chart. Then have partners discuss how the ball shows evidence of each energy form. Students then write their own explanations on the recording sheet.

4. Ask students to generate questions they have about flashing bouncing balls. They can record these questions in their science journals to share with the group when we meet to reflect on our findings.

5. Once students have recorded a question in their journals, have them select a question to investigate.

Examples of investigable questions could include:

• How much force is needed to bounce the ball so it lights up?

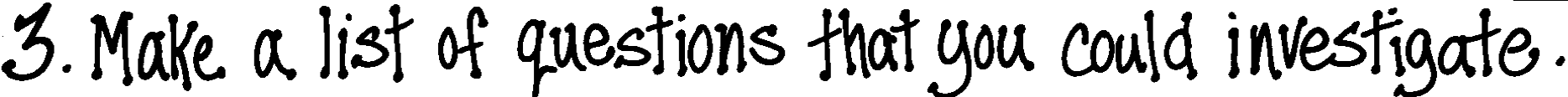
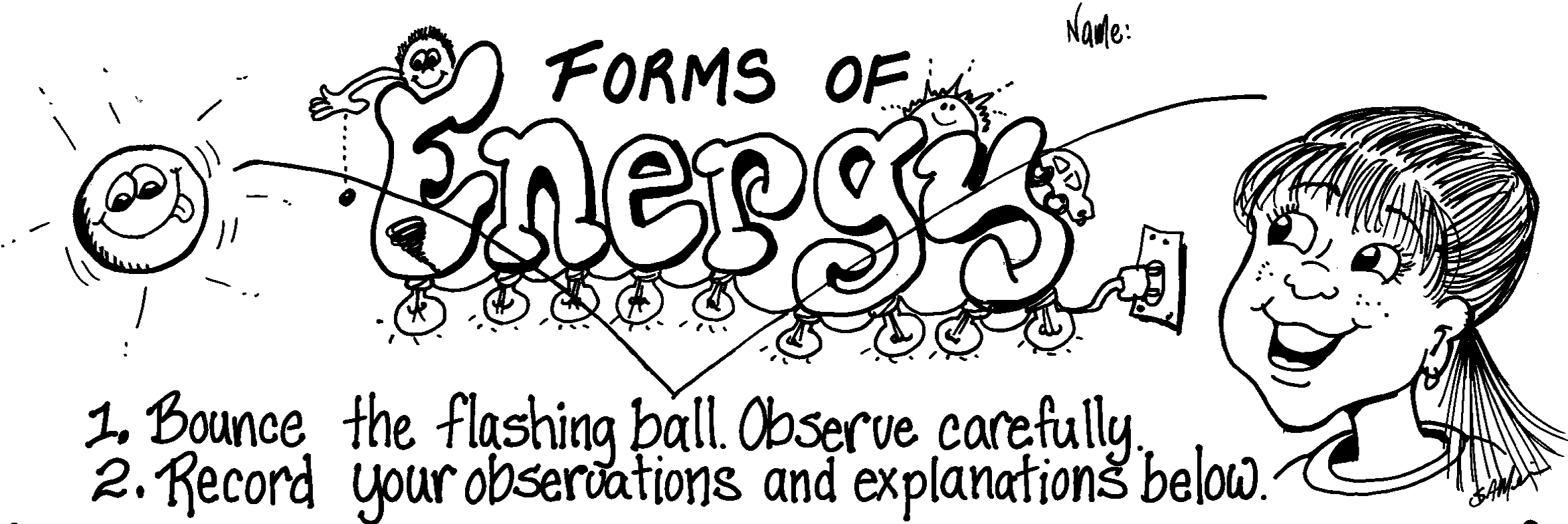
• Does the amount of force affect how brightly the ball lights up?

• What other ways can you make the ball light up? Rolling, etc.?

• How long does the ball stay lighted up?

6. When students have finished their investigations, they can explore various books on energy and motion from the science book bins located around the room.

7. When the entire class has finished we will meet back at the meeting area with our notebooks to share out our discoveries and answer any additional questions students may have.



Forms Observations of bouncing Explanation-How the ball

of energy (Evidence) shows evidence of this energy

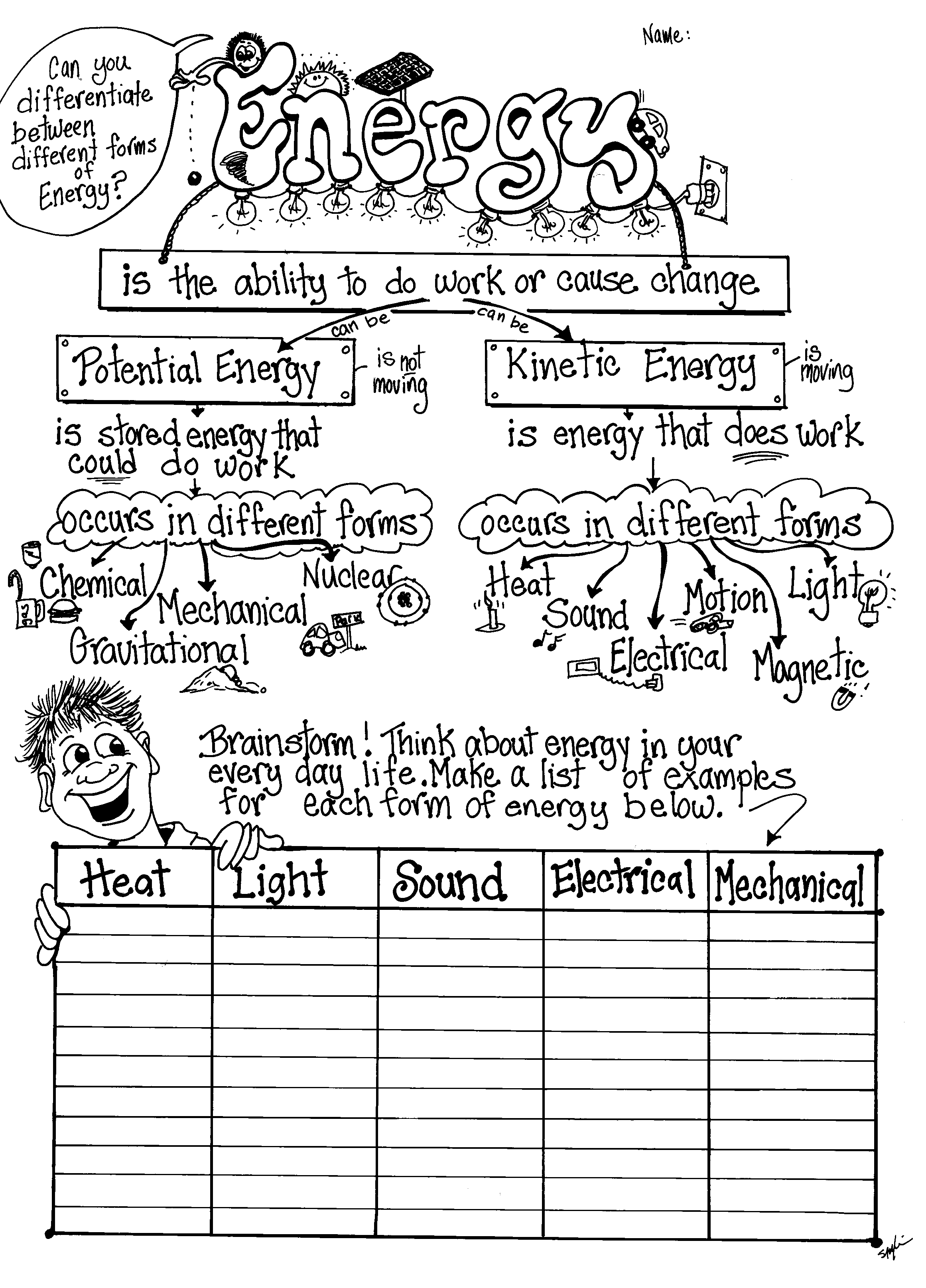
Mechanical

Sound

Electrical

Light

Heat



**Assesment:**

* Followed directions using appropriate safety precautions to complete the investigation.
* Described observations of mechanical energy when bouncing the flashing ball.
* Was able to explain how the ball shows evidence of mechanical energy.
* Described observations of sound energy when bouncing the flashing ball.
* Was able to explain how the ball shows evidence of sound energy.
* Described observations of electrical energy when bouncing the flashing ball.
* Was able to explain how the ball shows evidence of electrical energy.
* Described observations of light energy when bouncing the flashing ball.
* Was able to explain how the ball shows evidence of light energy.
* Described observations of heat energy when bouncing the flashing ball.
* Gave an explanation of how the ball shows evidence of heat energy.